

IMSG



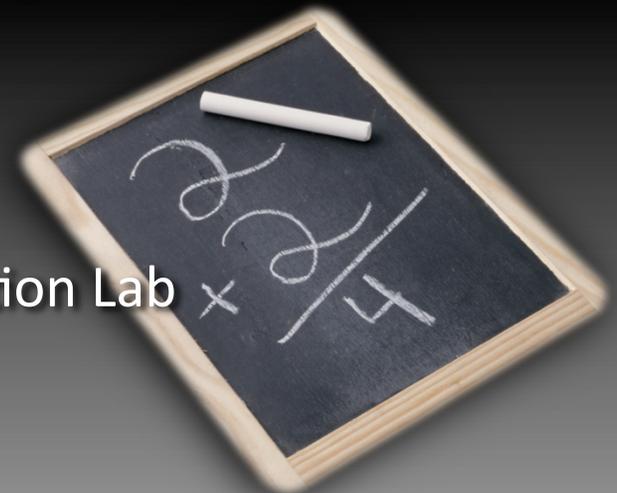
AMS 2009 – Phoenix, AZ – January 12

NOAA Data in the Classroom

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NOAA Environmental Visualization Lab

www.nnvl.noaa.gov



ARCTIC SEA ICE



In 2007, the amount of sea ice in the Arctic Ocean was the lowest ever recorded since satellite measurements began in 1979.

- Hypothesis testing
 - Hurricane models
- Random sampling and replication
 - Argo float data
- Variability and graphing
 - NOAA surface weather data and climate trends
- Average and deviation
 - SST data, anomaly, and coral stress



Activity 1: Testing hypotheses

- Observe weather patterns and make own hypotheses
- Develop a prediction about what will happen
- Provide alternative hypotheses

Data Portal 1: You need hurricane data?

- Show hurricane model projections
- Visualize current storm positions
- Compare projections to actual storm course

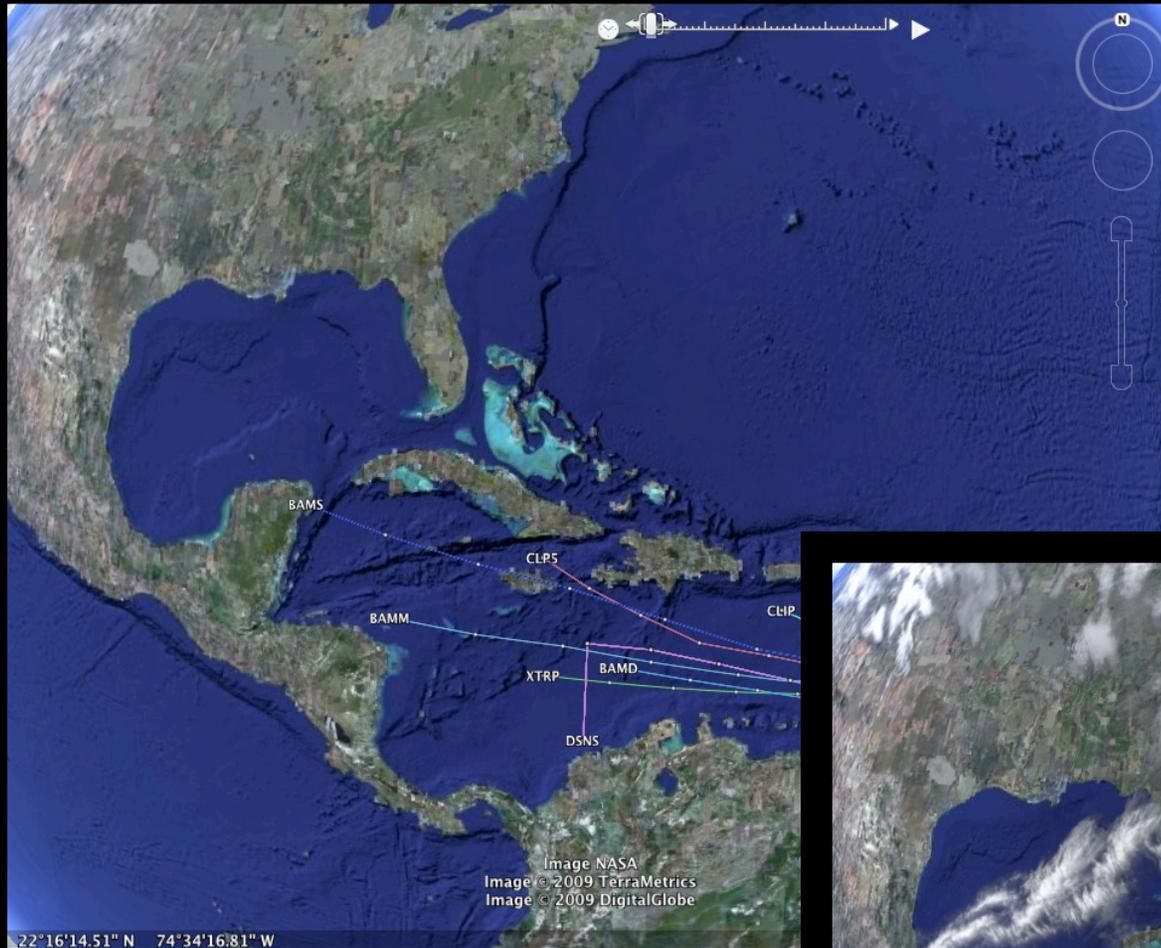


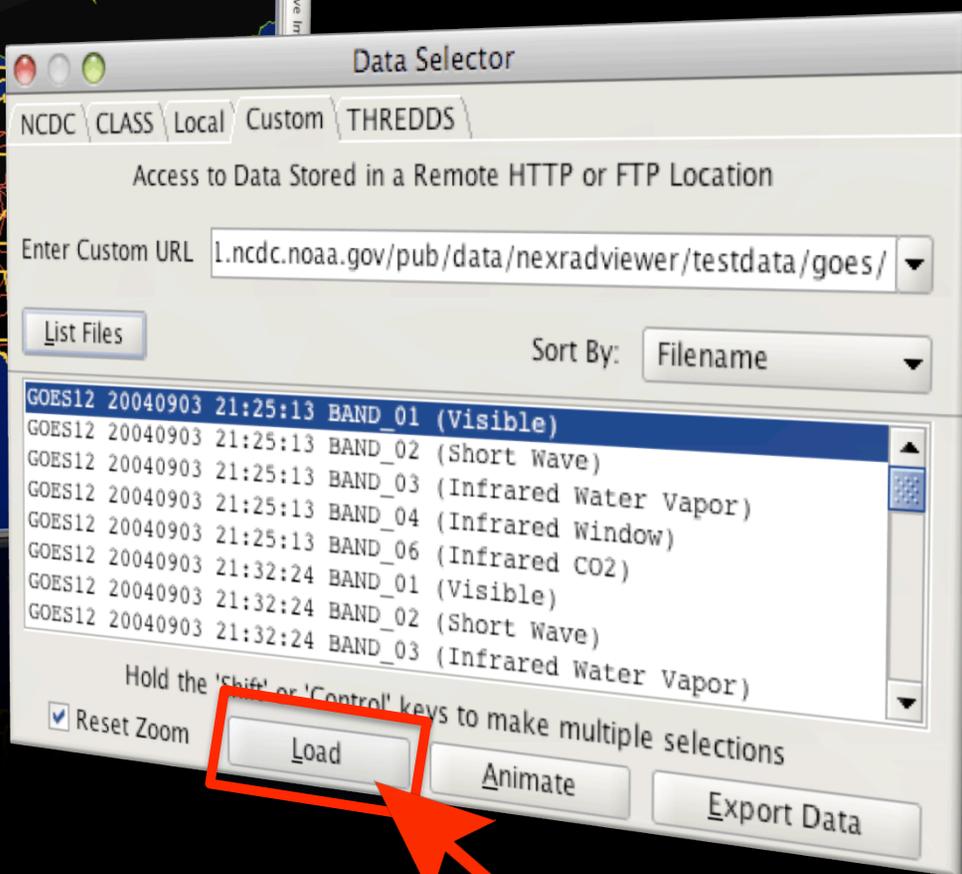
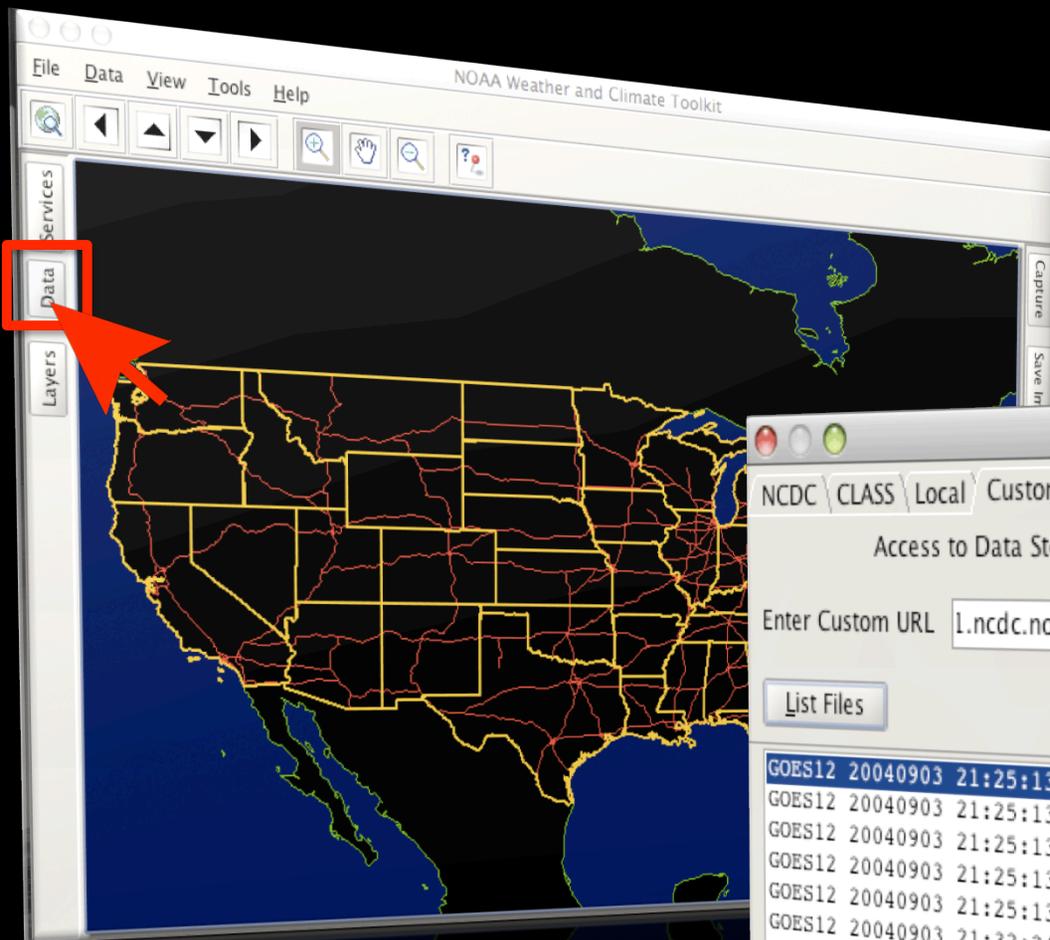
Solution

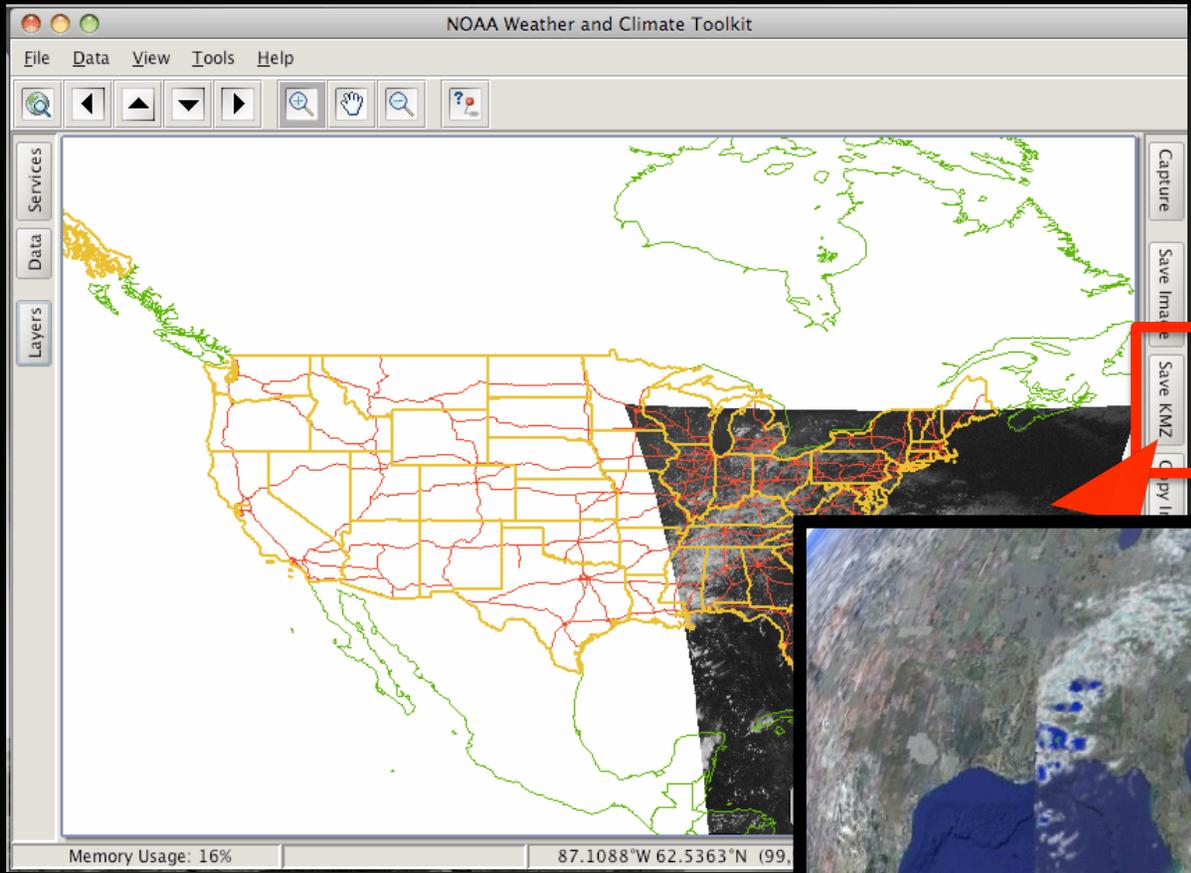
TropicalAtlantic.com hurricane models on Google Earth

Data from CLASS visualized with NOAA's Climate
and Weather Toolkit







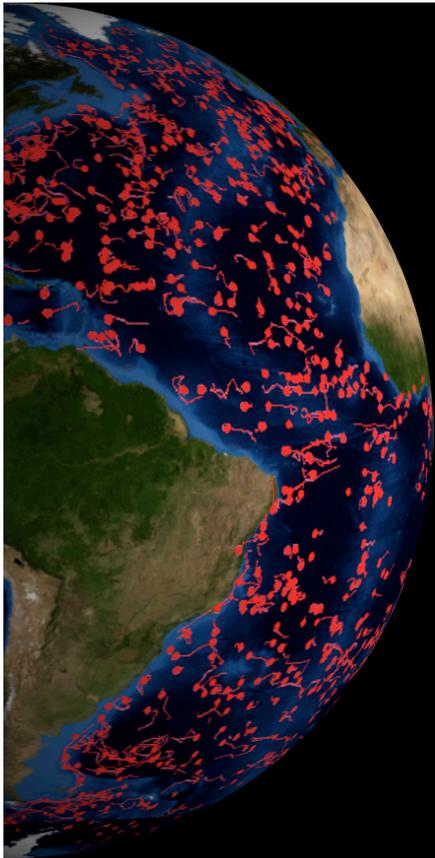


Activity 2: Experimental design

- Demonstrate random sampling
- Difference between replication and pseudo-replication
- Teach properties of physical oceanography
 - Temperature
 - Dissolved gases
 - Nutrient concentration
- Plotting coordinates

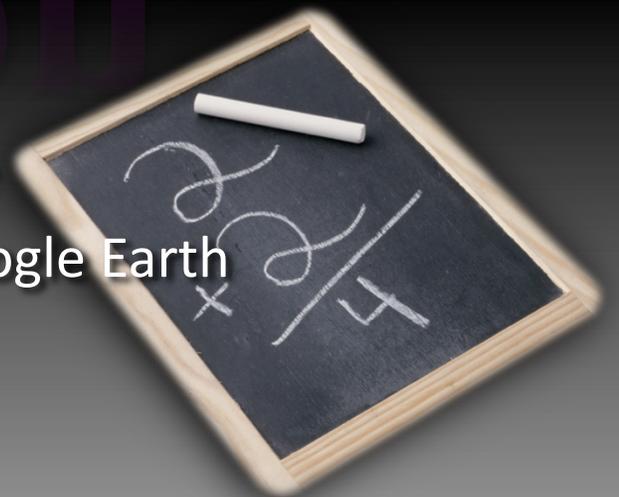
Data Portal 2: You need Argo data?

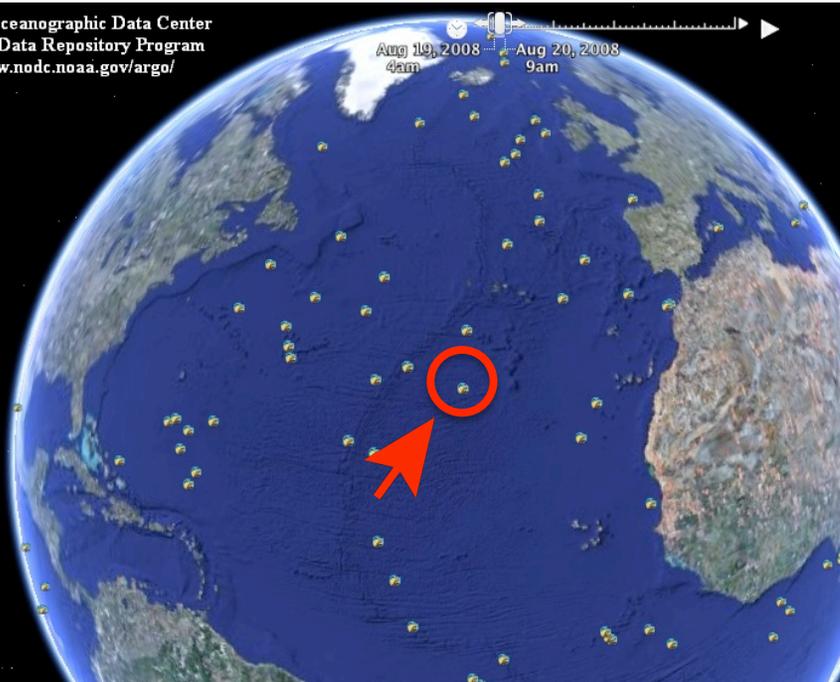
- Positions in time
- Current data collected
- NODC buoy archive is somewhat daunting



Solution

Argo float data from the
National Buoy Data Center on Google Earth





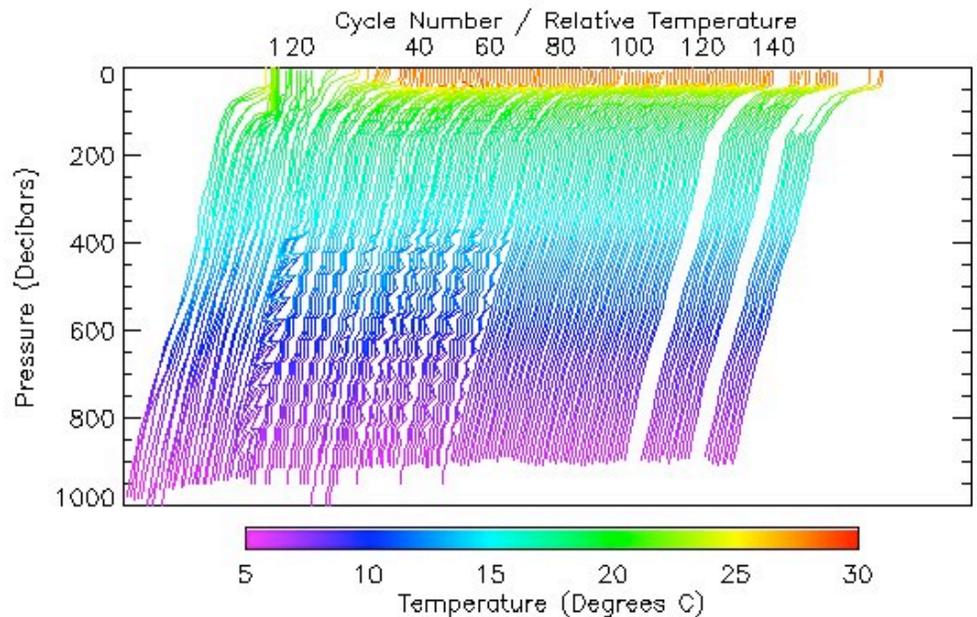
4900758/081

Float 4900758/Cycle Number: 081
 Obs. Date-Time: 2008-08-19 12:37 UTC
 Obs. Location: 43.041 W, 17.882 N
 Data Center: Atlantic Oceanographic and Meteorological Laboratory (AOML).

[Get the data](#)
[Display the waterfall plot of the temperature profiles.](#)
[Display the waterfall plot of the salinity profiles.](#)

pressure (db)	pressure QC Flag	temperature (deg. C)	temperature QC Flag	salinity (psu)	salinity QC Flag	conductivity (mhos/m)	conductivity QC Flag
5.0	3	27.014	1	36.958	1	5.792	0
10.0	3	27.008	1	36.971	1	5.793	0
15.0	3	27.010	1	36.970	1	5.793	0
20.0	3	27.004	1	36.975	1	5.793	0
25.0	3	27.005	1	36.974	1	5.794	0
30.0	3	27.069	1	36.956	1	5.799	0
35.0	3	26.738	1	37.044	1	5.774	0
40.0	3	26.605	1	37.067	1	5.763	0
26.552	1	37.079	1	5.759	0		
26.464	1	37.096	1	5.752	0		
25.551	1	37.184	1	5.663	0		
25.113	1	37.185	1	5.615	0		
24.959	1	37.210	1	5.602	0		
24.747	1	37.220	1	5.580	0		
24.390	1	37.247	1	5.545	0		
24.371	1	37.261	1	5.545	0		
24.284	1	37.287	1	5.539	0		
24.189	1	37.301	1	5.530	0		
24.154	1	37.315	1	5.529	0		
23.936	1	37.340	1	5.508	0		
23.828	1	37.343	1	5.497	0		
23.719	1	37.352	1	5.486	0		
23.634	1	37.345	1	5.476	0		
23.458	1	37.351	1	5.458	0		
23.321	1	37.342	1	5.442	0		
23.275	1	37.375	1	5.442	0		
23.269	1	37.385	1	5.442	0		
23.090	1	37.354	1	5.419	0		

24°16'40.77

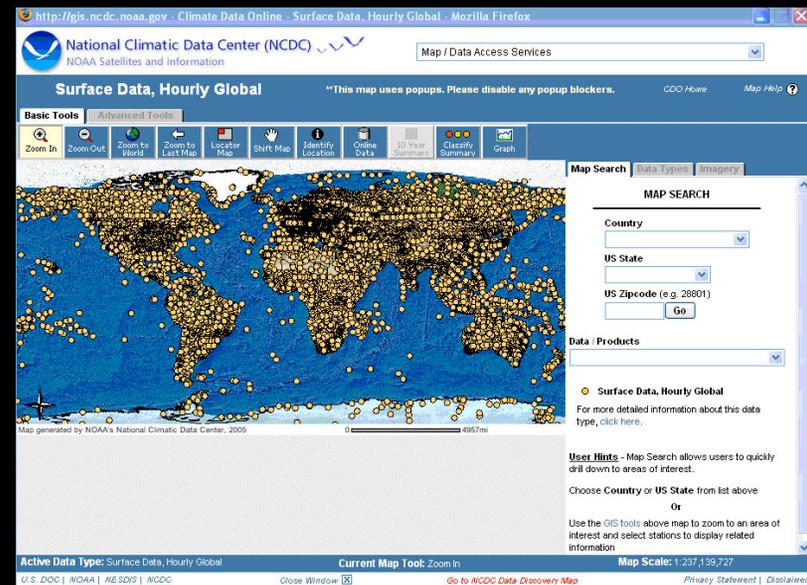


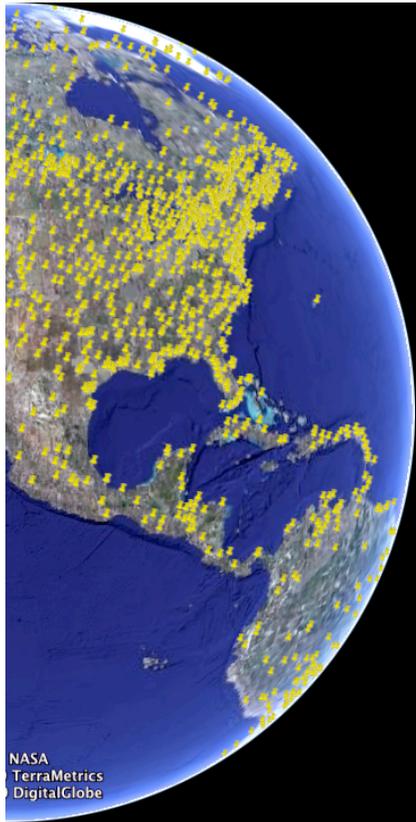
Activity 3: Variability and graphing

- Teach data collection
- Compare results to forecasts and “official” observations
- Use time series for data analysis and graphing exercises

Data Portal 3: You need temperature?

- NCDC's Global Summary of the Day





Solution

20101011

NCDC's GSOD data on
Google Earth

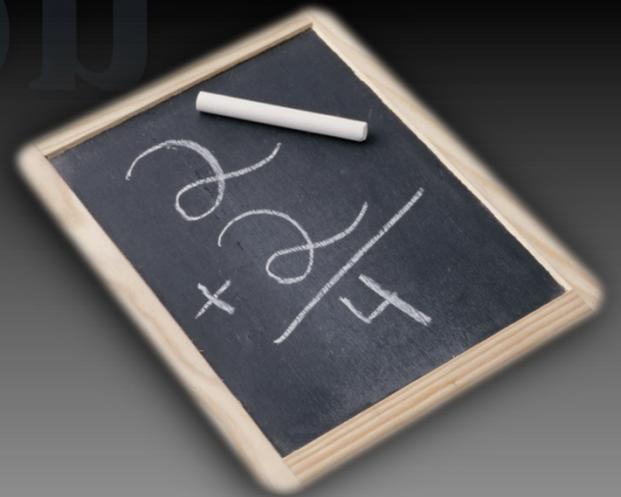




Image ©
Image ©

Global Summary of the Day (GSOD)

Select Date Restrictions:

Use Date Range

== OR ==

Use Selected Dates *

From Year: 2009 Month: 01 Day: 01
 To Year: 2009 Month: 01 Day: 01

Year Month Day
 1973 01 01
 1974 02 02
 1975 03 03
 1976 04 04
 1977 05 05
 1978 06 06
 1979 07 07
 1980 08 08
 1981 09 09
 1982 10 10

Tabular Data Output

Graphical Output

Select Output Media:

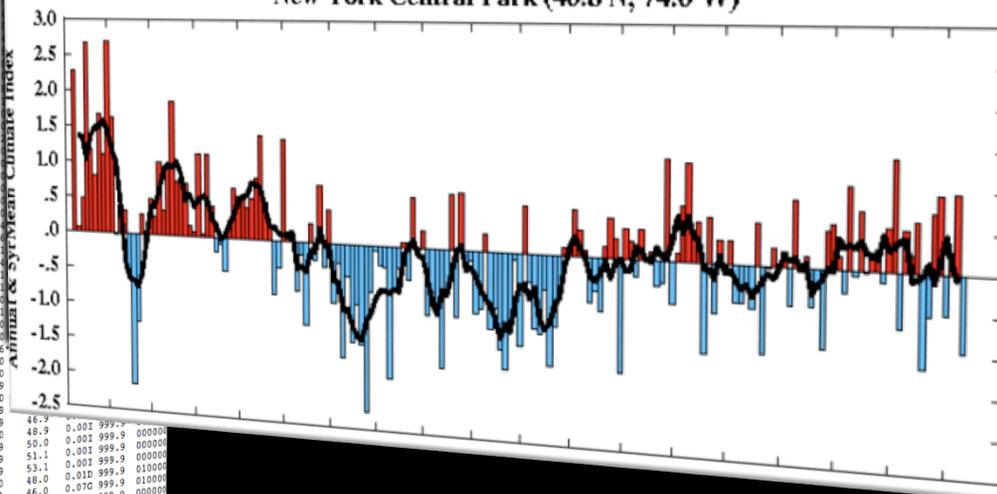
FTP

Select Output Format:

Space Delimited

STN	WBAN	YEAR	MODA	TEMP	DWPT	SLP	STP	VISIB	WDFP	WMSPD	WGSFD	MAX	MIN	TRC2	SNUP	TRSNUP						
722780	23183	20080101		53.9	24	13.8	24	1025.2	24	9999.9	0	10.0	24	8.0	24	21.0	27.0	66.9	37.0	0.001	999.9	000000
722780	23183	20080102		61.4	24	8.0	24	1022.5	24	9999.9	0	10.0	24	13.8	24	18.1	25.1	71.6*	57.2*	0.001	999.9	000000
722780	23183	20080103		60.0	24	17.2	24	1020.3	24	9999.9	0	10.0	24	6.7	24	9.9	999.9	71.6*	53.8*	0.001	999.9	000000
722780	23183	20080104		62.0	24	31.9	24	1018.1	24	9999.9	0	10.0	24	4.8	24	8.0	999.9	73.4*	51.8*	0.001	999.9	000000
722780	23183	20080105		62.0	24	39.2	24	1014.0	24	9999.9	0	10.0	24	4.3	24	8.9	999.9	73.0	54.0	0.001	999.9	000000
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722780	23183	20080108		52.4	24	44.0	24	1019.2	24	9999.9	0	9.6	24	3.6	24	8.9	999.9	62.1				
722780	23183	20080109		54.5	24	43.1	24	1017.7	24	9999.9	0	10.0	24	3.0	24	7.0	999.9	63.1				
722780	23183	20080110		53.4	24	42.3	24	1018.8	24	9999.9	0	9.7	24	3.4	24	7.0	999.9	64.1				
722780	23183	20080111		53.9	24	39.0	24	1017.1	24	9999.9	0	10.0	24	3.0	24	7.0	999.9	64.1				
722780	23183	20080112		54.3	24	36.9	24	1017.8	24	9999.9	0	10.0	24	2.7	24	8.0	999.9	68.1				
722780	23183	20080113		56.5	24	33.8	24	1017.4	24	9999.9	0	10.0	24	2.7	24	8.0	999.9	68.1				
722780	23183	20080114		59.9	24	23.2	24	1020.1	24	9999.9	0	10.0	24	8.0	24	15.0	21.0	69.1				
722780	23183	20080115		55.6	24	22.1	24	1020.1	24	9999.9	0	10.0	24	3.9	24	11.1	999.9	69.1				
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722780	23183	20080118		46.8	24	10.0	24	1018.4	22	9999.9	0	10.0	24	2.7	24	8.0	999.9	64.1				
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722780	23183	20080121		51.5	24	23.0	24	1014.1	22	9999.9	0	10.0	24	2.9	24	6.0	999.9	66.1				
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722780	23183	20080212		62.6	24	39.4	24	1011.9	24	9999.9	0	10.0	24	5.5	24	14.0	19.0	66.0	48.0	0.010	999.9	010000
722780	23183	20080213		62.6	24	37.0	24	1004.0	24	9999.9	0	10.0	23	6.1	23	8.0	999.9	66.1	46.0	0.070	999.9	000000
722780	23183	20080214		61.9	24	34.6	24	1011.9	24	9999.9	0	9.9	24	4.6	24	8.9	999.9	66.1	44.6*	0.000	999.9	000000
722780	23183	20080215		54.2	23	35.0	23	1010.9	23	9999.9	0	10.0	24	4.0	24	8.9	999.9	68.0	45.0	0.001	999.9	000000
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New York Central Park (40.8 N, 74.0 W)

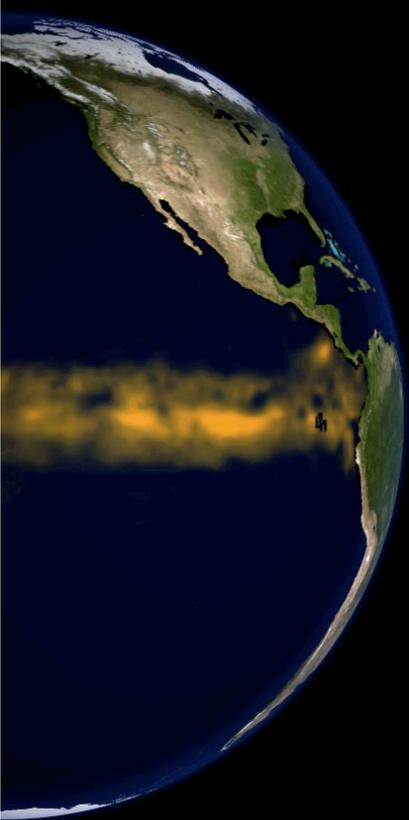


Activity 4: Data analysis

- Interpret false-color data
- Perform statistical analyses such as average and deviation
- Propose rationales for correlations in data

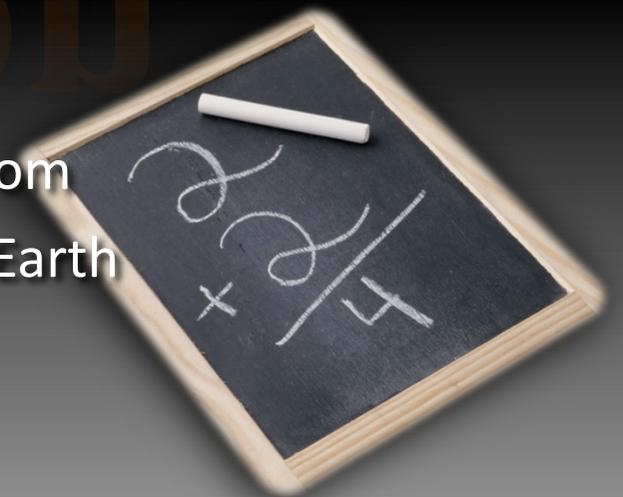
Data Portal 4: You need remotely sensed SST?

- Current SST and anomaly data
- Ability to get actual point measurements



Solution

Ocean temperature data from
Coral Reef Watch on Google Earth





05



Clipperton, French Polynesia

No Stress
(05 Jan 2009)

DHW (C-weeks)	0.0
HotSpot (C)	0.0
SST (C)	27.2
SST Anomaly (C)	-0.4
Max Month SST Clim	28.7

- [SST/DHW time series](#).

- E-mail coralreefwatch@noaa.gov to subscribe free automatic e-mail bleaching alert for this site.



Image NASA
Image © 2009 TerraMetrics
Image © 2009 DigitalGlobe

©2008 Google

12°20'36.16" N 104°59'43.61" W

Eye alt 9401.29 km

Links to Google Earth files and other resources

- NOAA Environmental Visualization Lab
<http://www.nnvl.noaa.gov>
- NCDC's global surface observation data
<http://gis.ncdc.noaa.gov/aimstools/kml/g sod.kmz>
- Tropical Atlantic hurricane model plots
<http://www.tropicalatlantic.com/plots/ge/Atlantic-Spaghetti.kmz>
- NCDC's Weather and Climate Visualization Kit
<http://www.ncdc.noaa.gov/oa/wct>
- Comprehensive Large Array-data Stewardship System (CLASS)
<http://www.class.noaa.gov>
- NODC's Argo float data
http://www.nodc.noaa.gov/argo/data/kmz/argo_latest.kmz
- Coral Reef Watch's SST and derived products
http://coralreefwatch.noaa.gov/satellite/ge/products/CRWGE_CurrentProducts.kmz

Thank You

NOAA Data in the Classroom

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